

The Attitude Construct in IT Adoption Research – A Scientometric Analysis

Research in Progress Paper

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Abstract

Understanding user's attitudes represents one of the major objectives in IS adoption research. However, in some IS adoption models, as the most famous representative the Technology Acceptance Model (TAM), the relationship between user's attitude and behavioral intention was found to be insignificant and was therefore excluded from later modifications of the respective models (e.g. TAM II and the unified theory of acceptance and use of technology). Some authors in IS adoption literature indicate that there are operational and conceptual misconceptions of the attitude construct in IS adoption literature. To provide more information for this discussion within this paper, the descriptive results of a scientometric survey of fourteen IS top journals spanning 20 years and 147 articles, are presented with regards to the socio psychological grounding of attitude research. Several situational factors of adoption situations in literature e.g. adoption context or voluntariness of usage were captured in the data in order to analyze the occurrence of each characteristic in IS adoption models with reference to their influence on the attitude construct.

Keywords: Adoption Characteristics, Attitude, IT Adoption, Scientometrics, Situational Moderators

Introduction

The use and acceptance of IT are social behaviors, where user attitudes towards IT represent an important antecedent for the endogenous variables. Based on the Theory of Reasoned Action (Fishbein and Ajzen 1975) from social psychology research, Davis et al. (1989) introduced the Technology Acceptance Model (TAM), which can be regarded as a starting point for several user acceptance models that have been proposed, tested, refined and unified throughout IS literature (Venkatesh and Davis 2000; Venkatesh et al. 2003; Sun and Zhang 2006; Venkatesh and Bala 2008).

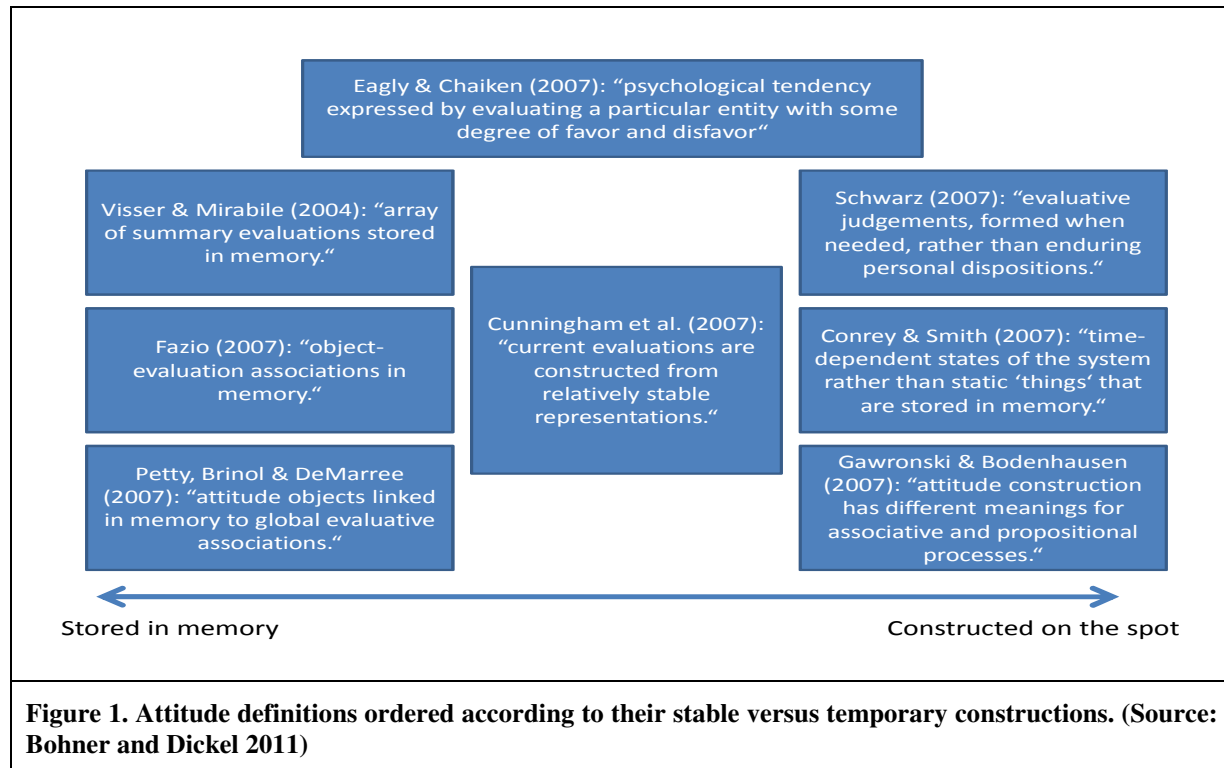
Even though, attitudes have been a core concept and major focus of theory and research in social psychology (McGuire 1986; Eagly and Chaiken 1993), the relationship between user's attitude and behavioral intention, was found to be insignificant in some basic approaches and therefore excluded from later versions of the TAM (Venkatesh and Davis 2000; Venkatesh 2000; Venkatesh and Bala 2008) and further important IT adoption models and theories (Venkatesh et al. 2003). However in other contexts/adoption models, attitude continued to be a core construct with high predictive validity (e.g. Harrison et al. 1997; Taylor and Todd 1995,). This led to the overall conclusion that attitudes do predict behavior but not in all circumstances (Ajzen 1988; Venkatesh and Davis 2000; Venkatesh et al. 2003). Some authors (Yang and Yoo 2004; Zhang et al. 2008) have already raised the issue, whether attitude deserves more attention in the IS field and if the measures of attitude, introduced by Davis et al. in 1989, are still consistent with contemporary social psychology research and the particularities of IS adoption scenarios.

This research addresses this issue in a preliminary analysis applying a scientometric approach. This method differs from empirical approaches since it provides a meso- instead of a micro-level perspective. In order to capture the role of attitude in IS adoption models and the influence of situational components within single studies, the scientometric methodology is suitable. The descriptive analyses of the four situational components (technology type, adoption status, adoption context and voluntariness) is meant to be a first step in analyzing, whether external circumstances can influence the predictive validity of attitude on behavior significantly. The four situational components of IS adoption were chosen since they were brought to discussion by various authors in IS Top journals (e.g. Bhattacharjee and Prekumar 2004; Jaspersen et al. 2005; Karahanna et al. 1999; Venkatesh and Brown 2001; van der Heijden 2004; Wu and Lederer 2009).

To provide the described information for the attitude construct, the paper is structured as follows: In section 2, we will briefly describe the social psychological background of attitude research in IT adoption, including the attitude concept and the attitude behavior relation. Situational factors in IS as the adoption context, the voluntariness of usage, pre- and post-adoption settings will be outlined because of their potential impact in the attitude behavior relationship. Therefore, within this paper, the collection of the data in regards to these aspects, as well as their descriptive appearance are analyzed. We then take these results and describe further steps

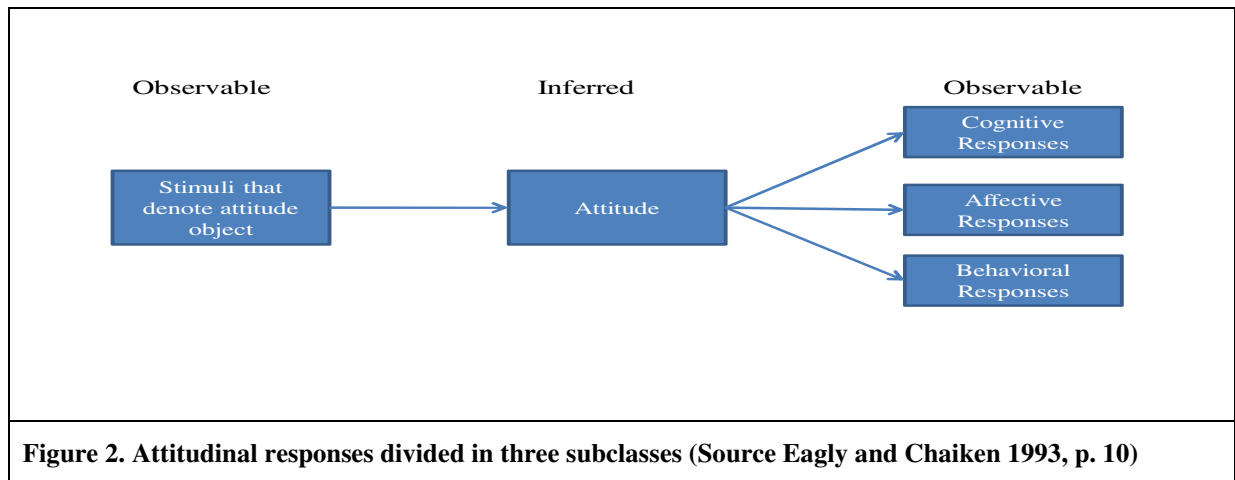
Theoretical background

In social psychology, attitude is a core concept of long-standing and continued importance (Allport 1935; Ajzen 2001). Still, the definition of attitude provides conceptual controversy among social psychologists. Different approaches exist as to the question, whether attitude is a stable entity stored in memory or a temporary judgment constructed on the spot on the basis of the information at hand (Bohner and Dickel 2011). Figure 1 depicts different conceptions and contemporary definitions.



Beside these time-related definitional approaches of attitude, another important issue, causing less controversy among researchers, refers to different classes of evaluative responses individuals hold about an object. Figure 1 describes evaluation as the foundation of the psychological state of an attitude, since six out of eight definitions of attitude contain a reference to evaluation. Eagly and Chaiken (1993), who define attitude as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor and disfavor” (p. 1), further comment on their conceptual understanding of the term psychological tendency as referring to “(...) a state that is internal to the person” and evaluating to “(...) all classes of evaluative responding, whether overt or covert, cognitive, affective or behavioral” (p. 1).

Cognitive responses contain thoughts, associations, or beliefs that people establish between the particular entity – the attitude object – and various attributes (Fishbein and Ajzen 1975; Bagozzi and Burnkrant 1985; Eagly and Chaiken 1993). The affective category consists of all classes of feelings or emotions that people have in relation to an attitude object (McGuire 1985), and the behavioral category is comprised of a person’s actions with respect to the attitude object, including behavioral experiences with the attitude object (Eagly and Chaiken 1993; Eagly and Chaiken 2007). This tripartite view of attitude is illustrated in Figure 2.



In IT adoption literature, the different classes of attitudinal responses have not been sufficiently acknowledged (Yang and Yoo 2004). The terms “affect” and “evaluations” were used interchangeably (e.g. Zajonc and Markus 1982; Davis et al. 1989, Davis et al. 1992; Venkatesh et al. 2003). With respect to empiricism this is valid, as long as the evaluative responses are highly correlated and thus interchangeable without causing losses in statistical power. However, some attitudes may be heavily weighted toward one or two classes of attitudinal responses, depending on the attributive structure of the attitude object and respondents’ characteristics. Regarding for instance utilitarian business-related infrastructure, an emotional response in terms of affect is highly unlikely. Furthermore, small behavioral responses are likely to occur without direct experience with the attitude object (Eagly and Chaiken 1993). Yang and Yoo (2004) note the lack of precision of IS adoption literature with reference to the different evaluative classes and the tendency towards affective scaling of attitudes (Venkatesh et al. 2003; Yang and Yoo 2004). However, they also only refer to a dyadic instead of a tripartite structure of attitude.

Apart from that, the actual controversy in social psychology about a stable or temporary construction of attitude outlined in Figure 1 has not taken hold in the IS adoption literature. These issues of attitude accessibility (how fast can subjects access information about the attitude object that are stored in memory) and attitude strength (how strong/resistant is the attitude someone has about the attitude object) that are manifested for instance in Fazio’s MODE Model (Fazio 1986; Fazio 1990; Fazio and Towles-Schwen 1999) were not addressed at all according to our data sample. We state that since the introduction of the Technology Acceptance Model (TAM) (Davis et al. 1989) in 1989, some attitudinal models, predominantly based on the Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975, Ajzen and Fishbein 1980) and the Theory of Planned Behavior (TPB) (Ajzen 1991), and aspects like different moderating conditions have been widely applied, while others such as issues about user’s attitude accessibility and strength as well as the consideration of all classes of evaluative responses in IS adoption models were mostly disregarded.

For this reason, the purpose of our scientometric study is to apprehend the status quo of attitude related research in IS adoption literature and take this as a starting point for further quantitative analyses. The theory outlines the adoption context of the studies, the system characteristics of the regarded technologies, the pre- vs. post- adoption contexts, as well as the voluntary and mandatory usage settings as situational factors that have the potential to strongly affect the attitude behavior relationship.

Therefore, within this paper, the collection of the data as to these aspects, as well as their descriptive appearance are analyzed. We then take these results and describe further steps with regards to the quantitative analyses to follow.

Methodology

In this section, we describe our scientometric approach, the underlying data pool and the inclusion criteria.

A scientometric approach was chosen for our literature review on attitude for the interesting insights into the manner in which IT adoption researchers publish their content. Leyesdorff defines scientometrics as “the quantitative study of scientific communication” (Leydesdorff 2001, p.1), while Lowry et al. (2004) regard it as “the scientific study of the process of science” (Lowry et al. 2004, p. 30). Lewis et al. lauded scientometric studies to facilitate the ongoing evaluation and improvement of an academic discipline (Lewis et al. 2007). As to the IS domain, Straub (2006) emphasized the importance of these self-studies to the development and progress of the IS field. Scientometric studies have been conducted on a broad range of topics, e.g. IS as a reference discipline (Grover et al. 2006) or the epistemological structure of the IS field in general (Benbasat and Zmud 2003). Scientometric studies differ from regular surveys as they focus on the article itself and not about people’s behavior or background (Hunter et al. 1982). With tools as citation analysis or meta-analysis scientometric studies observe paper titles, author names, paper abstracts and texts, or references and appendices.

To ensure the meaningfulness of our results, we included fourteen peer-reviewed journals of the IS field in our study because the identity of the IS discipline is largely established by top journals that publish in the field (Lowry et al. 2004). The scope of our research included every article found in these journals on the subject of IT adoption, starting with the early beginnings of IT adoption research and the introduction of TAM in 1989 (Davis et al. 1989) and ending in 2010. In total, we accessed more than 19764 articles via Business Source® Complete by EBSCOhost.

To search through the respective databases we applied the two main search techniques, “General Search and the “Advanced Search”, both including the Boolean operators (“AND”+“OR”) to facilitate the search with more than one search item. Alike the procedure in other literature research approaches (e.g. Williams et al. 2009) we mainly used the “General Search” allowing us a continuing procedure with consistent results and without any confusion.

In order to identify all relevant articles, the following inclusion criteria had to be fulfilled:

1. The study had to be published in MIS Quarterly (MISQ), Information Systems Research (ISR), Management Science (MS), Journal of Information Technology (JIT), Information Systems Journal (ISJ), Decision Support Systems (DSS), Communications of the ACM (CACM), Communication of the AIS (CAIS), Decision Sciences (DS), European Journal of Information Systems (EJIS), Journal of AIS (JAIS), Information and Management (I&M), Journal of MIS (JMIS) or Journal of Strategic Information Systems (JSIS).
2. The study had to be published between the introduction of Technology Acceptance Model in August 1989 (Davis et al. 1989), respectively September 1989 (Davis 1989) and the 2010.
3. The study had to contain some form of attitude or affiliated terms already found in literature (Fishbein 1963; Fishbein and Ajzen 1975; Ajzen 1991; Eagly and Chaiken 1993; Aizen and Fishbein 2000; Ajzen 2001).
4. The study had to be empirical, based on survey data. Conceptual models or research approaches using other research methods (e.g. Doll and Torkzadeh 1991; Dennis and Garfield 2003; Ortiz de Guinea and Markus 2009) were excluded.
5. The study had to include an endogenous variable measuring system usage or the intention to use a particular information system as in basic technology acceptance models (e.g. Davis et al. 1989; Venkatesh and Davis 2000; Venkatesh et al. 2003).

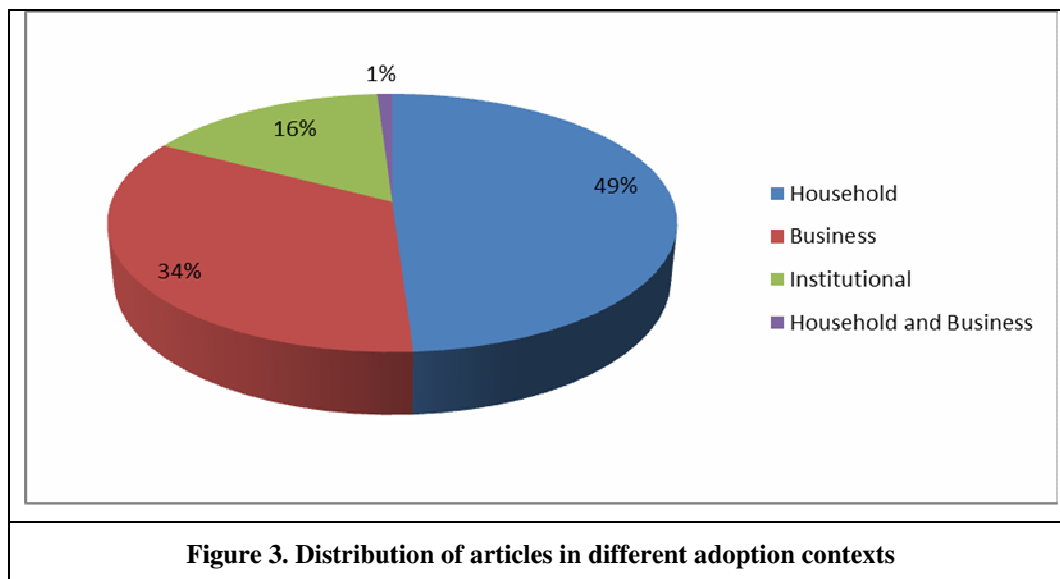
The scientometric search was limited to incidences of the chosen search term *attitude* appearing in the body, abstract or title of the respective article and the mentioned inclusion criteria. As a result, 472 articles were preliminarily extracted providing topics and content related to an individual’s attitude in technology adoption research. For the overall study, all articles were then manually crosschecked on their relevance. Findings were then categorized due to their title, author, year of publication, outlet, research subject, context, place and point of time of data collection, technology observed, number of survey participants, etc. The individual role of the construct attitude was observed concerning item measurement, methodological approach, beta value, significance (t-value), theoretical underlyings and construct definition, and impact on other exogenous and endogenous variables. The results were stored and coded within an excel sheet. To avoid biased findings and ensure validity of the results each identified

article was crosschecked and coded by at least two researchers of our three-person research team. After the coding process, 147 articles containing empirical evaluated research models made up the final sample.

Results

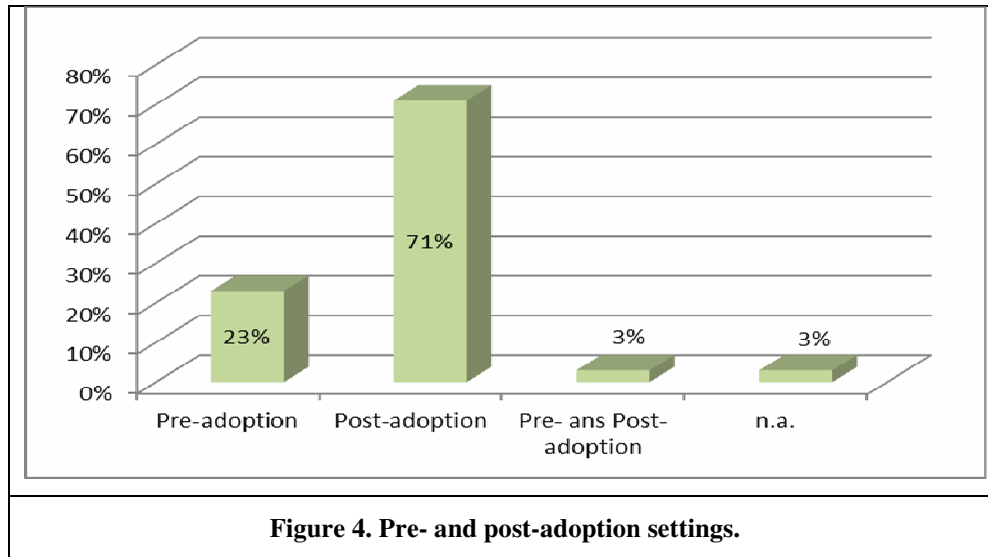
As stated above, we extracted 147 relevant articles among which 28 were published in MISQ, 9 in ISR, 3 in MS, 2 in JIT, 5 in ISJ, 8 in DSS, 6 in CACM, 4 in DS, 18 in EJIS, 9 in JAIS, 32 in I&M, 5 in JSIS and 3 in CAIS.

To make an assumption about the influence of the surroundings on individuals' attitudes, we listed the adoption context in which the study was conducted, and distinguished between pre- and post- adoption settings. Furthermore, we classified hedonic and utilitarian systems (van der Heijden 2004) and separated between voluntary and mandatory usage settings. Figure 3 depicts the results regarding the distribution of different adoption contexts, i.e. the private sector, while 34% addressed the individual IT adoption in organizations, 16 % on institutional IT adoption (e.g. adoption in institutions subject to public law, the health care system or public administration agencies) and 1 % concerned in both sectors household and business. Noticeable, in CAIS, ISJ, ISR and DS only households and business contexts were tracked.

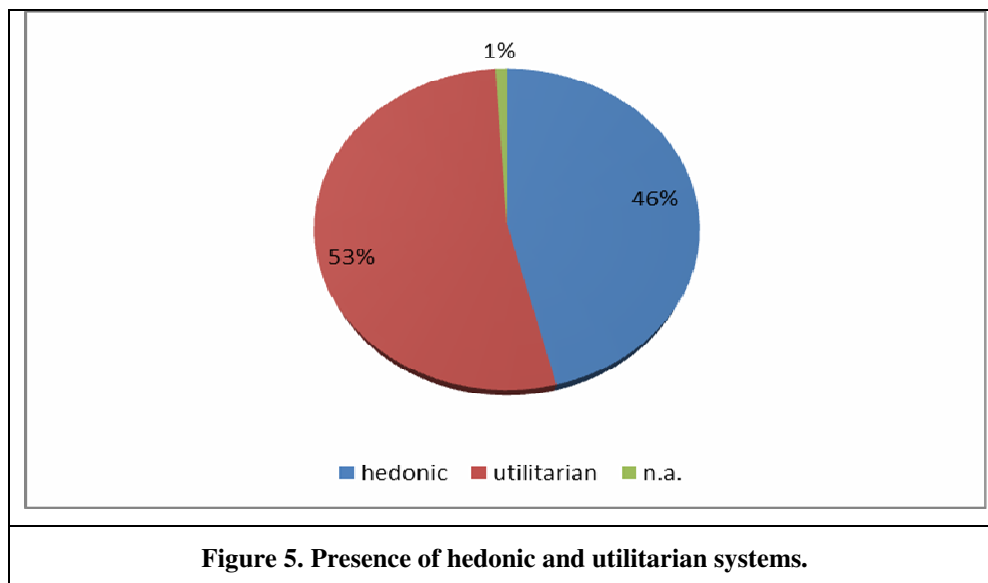


The pre- and post-adoption cluster refers to articles, where partial studies were conducted at different points in time including pre and post adoption settings. As to attitude formation, the measurement of behavioral responses is likely to occur only if subjects store usage experience in memory, which is accessed at the moment of survey (Eagly and Chaiken 1993). Thus regarding users attitude in IS, the distinction between pre- and post- adoption is essential.

Regarding the settings, Figure 4 indicates that almost three quarters of the studies were conducted in post-adoption settings, where users had used the system previously. Solely 23% of the articles addressed individual IT adoption, where users had not used the respective system before. Notably, some articles lacked information providing inference about the settings (3%).



Van der Heijden (2004) transferred the consumer behavior classification pattern of hedonic and utilitarian products to information systems. While hedonic systems aim at providing self-fulfilling value to the user, associated with pleasure or happiness, utilitarian systems aim to provide instrumental value such as increasing task performance (van der Heijden 2004). With regards to attitude formation, this distinction of systems is important insofar as utilitarian systems conceptually address cognitive behavioral responses, while hedonic systems are likely to cause affective responses. Van der Heijden (2004) devotes attention to this by adding perceived enjoyment to the TAM. As to the occurrence of the system types in our scientometric survey, the majority of utilitarian systems is consistent with the focus on management.



Regarding the usage behavior, we distinguished between four groups. The “voluntary and mandatory cluster” similar to the “pre- and post- adoption” cluster contains articles where partial studies implied both voluntary and mandatory usage settings (e.g. Venkatesh et al. 2003). The cluster “quasi-mandatory” contains studies, where the usage of the system was in fact voluntary, but by refusing usage it would be

very difficult to accomplish work orders (e.g. Titah and Barki 2009). In total, the studies examining voluntary usage behavior make up almost 73%.

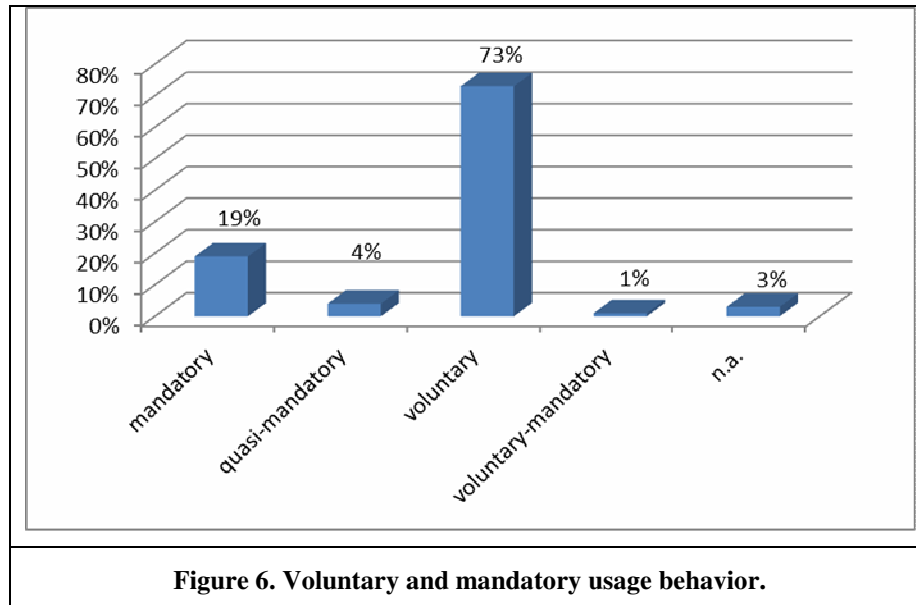


Figure 6. Voluntary and mandatory usage behavior.

Conclusion

As to attitude, the results of this research indicate that IT adoption literature lacks behind recent developments in social psychology. The theory on attitude formation is conceptually divided into two research perspectives, namely a stable versus a temporary conceptualization of attitudes. Both imply a tripartition of attitudinal responses affect, cognition and conation. This tripartite view is widely applied and acknowledged in social psychology (e.g. Eagly and Chaiken 1993 2007; Olson and Kendrick 2008). In IS adoption literature however it is rarely mentioned (e.g. Yang and Yoo 2004). With further of analysis we will investigate the discriminant validity of the three classes. Furthermore, the consequences of disregarding the differences between affect and cognition in adoption models on the attitude behavior relationship will be examined by means of quantitative methods.

Situational factors that have potential impact in the attitude behavior relationship in IT adoption models, which we descriptively illustrated in the last section, will also be investigated as to their power of impact. Our scientometric survey outlined that, as to the fourteen journals, the majority of articles including attitude were published in I&M and MISQ. Among the 147 articles we identified, 34% addressed the business sector, while 49% were distributed in the household sector. With regards to the classification of settings, system characteristics and usage behavior, results indicated that in both journals the majority of studies were conducted in post-adoption settings with utilitarian system characteristics and voluntary usage behavior.

Given that emotional responses in terms of affect are highly unlikely in mandatory, utilitarian, business-related infrastructures (Eagly and Chaiken 1993) and the fact that these survey settings are dominant and at the same time affective scaling methods of attitude hold the dominance in IS adoption literature (see Venkatesh et al. 2003, p. 455-456), the need of further research on that topic is evident.

This data is the starting point for the investigation of two important research questions. First, if the attitudinal response classes have some impact on the attitude behavior relationship, and second, if the situational factors such as adoption context or voluntary involvement that are captured in the data, explain some of the inconsistencies that exist within the relationship of attitude and behavior in behavioral models. The analysis of scientometric data is specifically necessary in order to interpret the results on a molar level.

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